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ILLUSTRATIONS OF A "STRANGLING" FIG TREE.

BY WILLIAM TRELEASE.

Visitors to the tropical Atlantic American coast region frequently speak of the curious sight of a large deciduous tree growing with its trunk variously wound and netted about that of some other tree, commonly a palm, which they have been told is ultimately choked or smothered to death. English speaking people sometimes call the attacking tree "the strangler." The Mexican country people have for it the name higo, or its augmentative higon, into which the Latin ficus, changed in our language into fig, has been softened in the Castilian; though when mentioned in print it is more commonly and properly called higuero or higuérón, the name of the tree, — the preceding words pertaining rather to its fruit.

The species illustrated in the accompanying plates 39 to 45 is very abundant in the vicinity of Rascon, on the Tampico branch of the Mexican Central railway, at the edge of the picturesque Huasteca district. When mature, it is a large wide-spreading tree with thick irregular trunk, shortly petioled coriaceous elliptical or ovate rather round-based mostly bluntly acuminate glabrous leaves paler beneath, and short-stalked coarsely pale-warty somewhat turbinate solitary fruits with a rather large sunken apical pit in which lies the 3-bracted foramen (plate 45).

It might be assumed to be this species that Pringle (no. 3554) distributed from the Tamosopo cañon, a few miles up the mountain from Rascon, which, with specimens collected elsewhere in the Huasteca by other botanists, is ranged by Watson* with or beside his *Ficus fasci-*

* Watson, Proc. Amer. Acad. 26: 152.

culata of the Sonoran coast with the suggestion that all may perhaps be referrible as forms under the Central American *F. sapida* Miquel; but a few leaves which I owe to Mr. Pringle, and his note that they are from a small tree found on limestone ledges, make this assumption improbable.

From descriptions and the illustration of *F. sapida* given by Seemann,* showing decidedly narrow acute-based leaves, I should hesitate to connect the Rascon fig closely with the typical form of that species, though the limits of foliage variability in these figs of the section *Urostigma* have not been sufficiently noted by accurate field observers to warrant one in drawing too rigid conclusions from single herbarium sheets or figures. Its affinities are evidently with the group of species centering about *F. populnea*, of which the west-coast *F. fasciculata* and *F. padifolia* and the east-coast *F. ligustrina* are representatives. For the present I should place it under the last-named species, which, under the name *Urostigma Schiedeana*, has been noted by Miquel† from somewhat further down the eastern coast of Mexico.

Because of their customary final effect on the trees with which they are intimately associated, these strangling figs are often spoken of as parasites, a designation which has crept into good and even recent books.‡ The expressions epiphytic and ephiphytal employed respectively by Schimper§ and Sargent¶ are more accurate, since the trees usually if not always lack a haustorial or even graft-like connection with the host, though their own roots intergraft; and the

* Seemann, Bot. Herald. pl. 35.

† Miquel, Hooker's Journ. of Bot. 6 : 539.

‡ Nuttall, Sylva. 2 : 4. — S[argent], Garden & Forest. 1 : 128; Silva. 7 : 95. — Small, Flora S. E. U. S. 362. — All referring to *F. aurea*.

§ Schimper, Epiphytische Vegetation Amerikas. 60. (Bot. Mittheil. aus den Tropen. 2).

¶ Sargent, Silva of N. A. 7 : 97.

term hemi-epiphyte, later applied to these figs and plants of similar habit by Schimper* still more truly indicates their relation to the host, as they "germinate and pass through their earliest development on trees but subsequently become connected with the ground by their roots" thus passing from the epiphytic to the ordinary mode of nutrition.

In the genus under consideration Schimper† finds the largest representatives of his hemi-epiphytes, among the banyans and other figs of the tropics of both hemispheres. Striking pictures of some of these plants have been published by various writers.‡ Perhaps the most interesting individual case is that of the famous banyan (*F. Indica*) of the Calcutta botanical garden, which in its mature form has served as the subject of many photographs and engravings. According to Hooker,§ in 1782 its site was occupied by a wild date-palm out of the crown of which the banyan sprouted; but the palm has long since disappeared, while the fig of late years is said to have lost a number of its horizontal branches so that in places it is broken into a ver-

* Schimper, Pflanzen-Geographie. 340, 343; English translation. 319, 320.

† Schimper, Pflanzen-Geographie. 344; English translation. 321.—One of the younger plants of this type is shown in *f. 158*; a seedling, in *f. 160*; and a good illustration of one of the species overgrowing a Venezuelan *Copernicia*, in *f. 200*.

‡ Schimper, Epiphytische Vegetation Amerikas. *pl. I* (an unnamed Sikkim-Himalayan species). — Kerner, Pflanzen-Leben. **1**; English translation. **1**:159, 704. *f. 168-9* (*F. Benjamina* "incrusting" some myrtaceous tree on one of the Nicobar islands, *f. 169*; and an unnamed species in the earlier stages of its root development, *f. 168*. The plants are called "tree-constrictors"). — Wettstein, Vegetationsbilder aus Südbrasilien. *pl. 31*. — A quotation from Tennent's Ceylon, in The Garden. **25**:446, gives an interesting general account of the phenomenon in that island. — Gardeners' Chronicle. **III. 18**:327. *f. 61* (a species doubtfully referred to *F. Istala*, on the mango).

§ Hooker, Himalayan Journals. **2**:254. — See also Bailey's Cyclop. Amer. Hort. **2**:582.

itable grove of distinct trees though for its greater extent it is still one many-columned tree.

Curious freaks of the roots of various species of the genus, aside from this biological peculiarity, are noted by Hooker,* Kerner,† and others; and the production of columnar roots beneath the branches of banyans and some other figs is too well known to require more than passing mention.‡

In the Huasteca region, large areas are occupied by almost pure forests of the east-coast tree palmetto (*Sabal Mexicana* of most writers; *Inodes* sp. of Cooke). When not injured by fire,—for the pastures in which they stand are frequently burned over at the end of the dry season,—these palms have the upper part, at least, of the stem covered by long-persistent petiole bases from which the old leaves have broken away. These form a very good nidus for the bird-disseminated seeds of the fig, which, germinating, give rise to plants that live for a few years as true epiphytes, forming bushy growths below or among the apical leaves of the palm (plates 39, 43).§ Later, begins the characteristic formation of descending and encircling, often anastomosed, roots (plates 39, 40, 43). It is these which, becoming at length largely or entirely confluent (plate 41), constitute the pseudo-trunk of the fig,—hollow at the center through which the original palmetto host passes, often persisting until a very advanced age and size of the strangler have been attained (plates 42, 43), its

* Hooker, *Himalayan Journals*. 2: 271. *frontispiece*.

† Kerner, *Pflanzen-Leben*; English translation. 1: 710. *f.* 171. 2: 758. *f.* 428.

‡ See, for a few striking illustrations: Kerner, *l. c.*, English translation. 1: 757. — Schimper, *l. c.*, English translation. 322. *f.* 162 (*F. Bengalensis*). — Gardeners' Chronicle. III. 4: 214. *pl.* — S[argent], *Garden & Forest*. 1: 128. *f.* (*F. aurea*).

§ *F. Bonplandiana* has been distributed by Pringle (no. 3997) from Micos, somewhat further up the mountain, with a note showing that it develops in the same way.

final disappearance leaving the fig tree of the adult form shown in plate 44. Meantime the latter, itself, has become the host of numerous orchid, bromeliad and fern epiphytes, and may even bear secondary plants of its own species, some of which themselves may effect a connection with the ground (plate 42). Morphologically, therefore, the main pseudo-trunks of these hemi-epiphytic figs, like the columnar props which some of them form under their branches, are roots and not stems, — a fact which must be taken into account in studying their anatomical structure.

EXPLANATION OF PLATES.

The illustrations are from photographs by the author, all made about Rascon, in the State of San Luis Potosi, Mexico.

Plate 39. — Palmetto with upper part of stem covered with petiole-bases in the axils of which are established a large epiphytic bromeliad, and a rather small fig the roots of which have already closely invested the middle part of the trunk.

Plate 40. — At the left, a palmetto the petiole bases of which support numerous small epiphytes. In the center, a palmetto with two well established figs.

Plate 41. — Part of the trunk of the central tree of plate 40, showing the characteristic roots of the fig and the influence of such obstacles as petiole bases of the palmetto on the direction of their growth.

Plate 42. — An old but openly branched fig tree with the axile palmetto still vigorous. The fig itself bears clusters of ferns, *Tillandsia*, etc.. A small independent trunk is shown at the right.

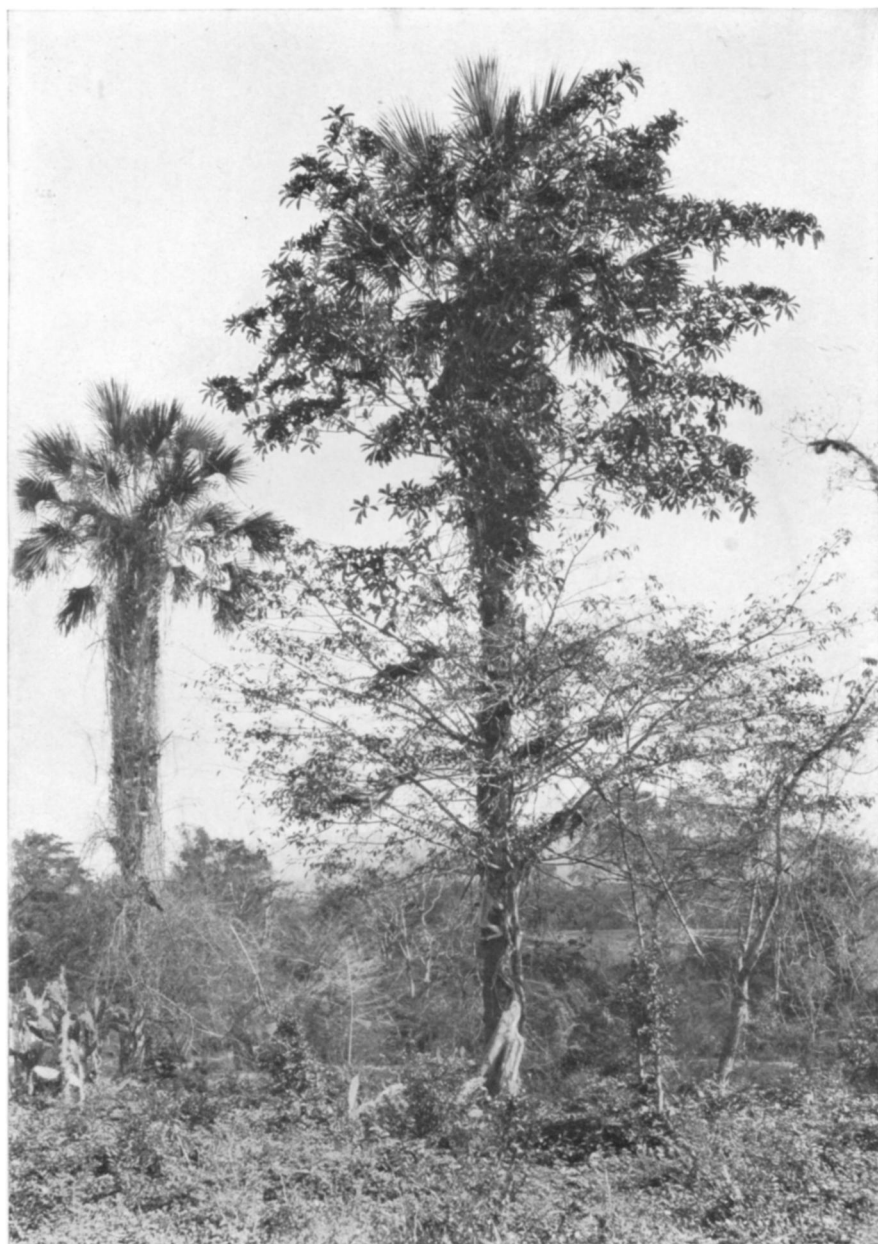
Plate 43. — At the left, a palmetto bearing a well started young fig. At the right, an old fig tree the dense branches of which closely surround the leaf cluster of the central palm.

Plate 44. — A very large mature fig tree from the center of which the original palmetto host has entirely disappeared.

Plate 45. — Fruiting spray of the strangling fig of Rascon (*F. ligustrina?*), natural size.



MEXICAN "STRANGLING" FIG.



MEXICAN "STRANGLING" FIG.



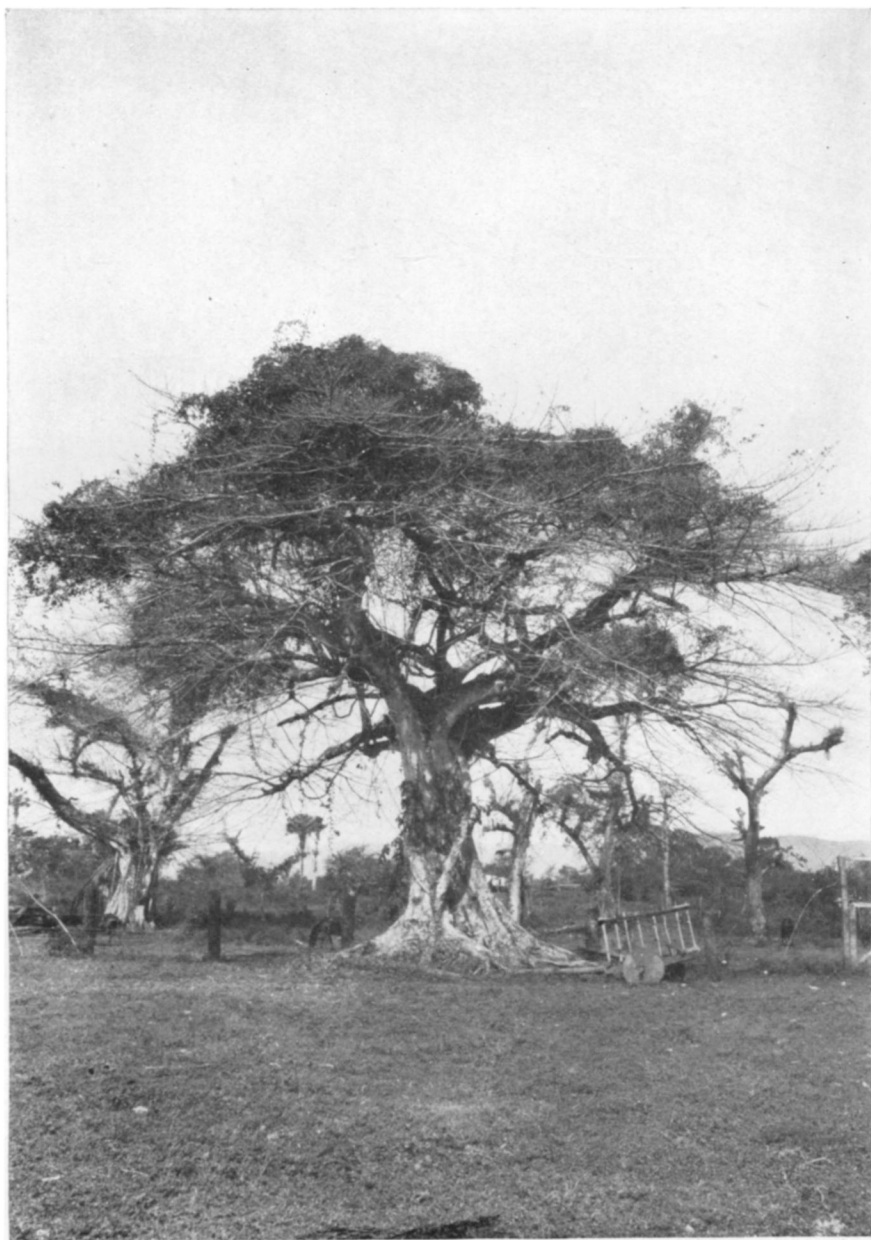
MEXICAN "STRANGLING" FIG.



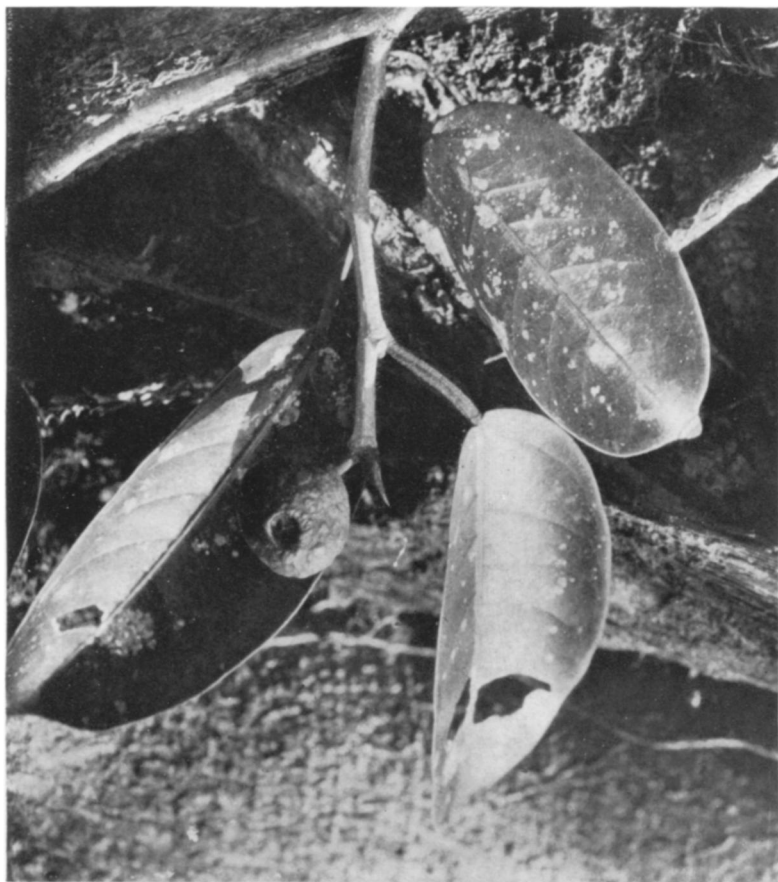
MEXICAN "STRANGLING" FIG.



MEXICAN "STRANGLING" FIG.



MEXICAN "STRANGLING" FIG.



FICUS LIGUSTRINA?